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GEOPHYSICAL ABSTRACTS

NO. XL

BY

FREDERICK W. LEE

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DEPARTMENT OF COMMERCE - BUREAU OF MINES

GEOPHYSICAL ABSTRACTS[1]

No. 40

Compiled by Frederick W. Lee[2]

	Page
1. Gravitational methods	529
2. Magnetic methods	534
3. Seismic methods	540
4. Electrical methods	544
5. Radioactive methods	546
6. Geothermal methods	550
7. Unclassified methods	551
9. New books	552
10. Patents	553

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1. GRAVITATIONAL METHODS

(895) NOUVELLE MÉTHODE DE MESURE DE LA GRAVITÉ

(NEW METHOD FOR MEASURING GRAVITY)

By M. F. Holweck

Société des Ingénieurs Civils, Séance du 22 April, 1932.

The author makes use of an astatic pendulum in which the forces of gravitation are, to a great extent, compensated by the forces of a constant flection produced by a thin plate made of elinvar steel (a material the elastic modulus of which changes very little with the change of temperature). The total weight of the oscillating mass is only a few grams, and thus corrections caused by affecting the support can be eliminated.

The pendulum described is many times more sensitive to the variations of "g" than the ordinary pendulum. It is sufficient to measure its frequency with a simple pocket chronograph in order to obtain in 10 minutes the number sought for with an accuracy of about one or two millionths; this is accomplished by means of a device which does not exceed some 10 kilograms in weight and which can be installed at any place.

The author shows the diagrams by which the sensitivity of the instrument is proved and gives values obtained from experiments.--V. Perebaskine's abstract translated by W. Ayvazoglou.

(896) MESURES DE GRAVITÉ AU MOYEN DE L'APPAREIL HOLWECK-LEJAY NO. 2

(GRAVITY MEASUREMENTS BY MEANS OF HOLWECK-LEJAY'S NO. 2 APPARATUS)

By P. Lejay and R. Goudey

Comptes Rendus de l'Académie des Sciences, Paris,
vol. 194, No. 19, 1932, p. 1632.

The authors obtained for Besancon the following value for "g":

$$G = 980.751 \text{ centimeters/sec}^2$$

This figure is in very good accord with that obtained from the results of the first series of measurements.--V. Perebaskine.

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(897) TORSION BALANCE WITH THREE BEAMS (IN RUSSIAN)

By B. Numerov

Bulletin de l'Institut Astronomique, Leningrad, No. 30, 1931, pp. 103-108.

A model of a torsion balance with three inclined beams was constructed in 1928-29 at the Astronomical Institute. A photograph of the instrument is given.

The new torsion balance has been constructed for visual observations and was to possess the following features and advantages:

1. In the 3-beam system we have a continual check over the work of the balance, as the mean of the readings of the three beams must remain constant at any azimuth.

2. For the determination of the gradients of the variation of gravity it suffices to effect observations in two azimuths only at 0° and 180° or at 90° and 270°.

3. To determine the curvature gradients we have but to make an additional observation in the third azimuth.

4. Owing to the fact that there is no need repeatedly to make checking observations, and as in the general gravity survey we can limit ourselves to observations of the gradients of gravity variation alone--that is, to effect observations in two azimuths--it is rational to keep to visual observations.

5. Every beam system, together with the cap, may be changed independently of the other beams.

6. The instrument may be turned by hand, without any clockwork, and its setting in the azimuth and the leveling are done by means of a compass and a level fixed to the upper lid of the case covering the three beams.

7. The arresting of the three beams may be done simultaneously.

In the beginning of 1931 Bamberg's firm constructed the apparatus according to our indications, introducing, however, a very important improvement--namely, a new system of damping which allowed the observations in one azimuth to be completed within 20 minutes. Thus we actually are able to finish the observations and to check them at the given place within one hour.

In this article formulas and an example of computing the gradients by observations of the three beams in azimuths 0°, 90°, 180°, and 270° are given.

Preliminary results obtained with the new torsion balance, the speed of the observations, and the check at the observations show that the new type of 3-beam torsion balance presents a considerable advantage over the old system and affords a manifold increase in the efficiency of the general gravity survey.--Author's abstract.

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(893) GRAVITY DETERMINATION IN VIRITSA AND DETSKOE SELO (IN RUSSIAN)

By A. M. Gishitsky

Bulletin de l'Institut Astronomique, Leningrad, No. 30, 1931, pp. 108-109.

In the spring of 1929 a determination of gravity was carried out in Viritsa, Detskoe Selo, and the astronomical observatory of the University of Leningrad. Bamberg's apparatus with pendulums, Nos. 116, 117, 118, and 119, served for the observations. The Astronomical Institute was accepted as the starting point with g = 981.927. In Viritsa and Detskoe Selo 16 pendulum observations were made during one day. The rate of the contact chronometer was determined by Bordeaux rythmic signals. At the astronomical observatory of the university the work was effected by means of Nardin chronometer 1146, and at other points with Nardin chronometer 2297. The coswinging of the support was determined by Borras' method. A table gives the durations of the swinging of pendulums at different points. The rate of Nardin chronometer 1146 was changing more than 2 seconds during the process of the work, thus the observations at the astronomical observatory of the university are not reliable and can not be used to transfer the gravity from this point to the Astronomical Institute. A table shows the results of the final elaboration of the observations. The theoretical value of gravity is computed in Helmert's formula of 1909. The observations point to a considerable decrease of gravity south of Detskoe Selo; this agrees with the results obtained previously.--Author's abstract.

(899) GRAVITY DETERMINATIONS IN WEST SIBERIA (IN RUSSIAN)

By A. M. Gishitsky

Bulletin de l'Institut Astronomique, Leningrad, No. 30, 1931, pp. 109-113.

In the summer of 1930 gravity determinations were carried out between Tcheliabinsk and Petropavlovsk with the purpose of locating mountain ranges buried under the west Siberian plain. The observations were made by means of four Sterneck pendulums, Nos. 95, 96, 97, and 127, at 13 stations.

The pendulums were suspended to a special support constructed in the work shop of the Astronomical Institute. Its structure differs somewhat from that usually adopted: The plate to which the four pendulums are suspended is fastened to the support having the shape of a truncated cone. In the center it has a considerable aperture through which the pendulums are lowered into the apparatus. After the pendulums are suspended the aperture is closed by a plate on which the optical part of the apparatus is mounted. The thermometer is in the center of the apparatus. After the installation the apparatus is covered at the top by a ground lid having the shape of a disk.

The Astronomical Institute served as a starting point with G = 981.927. Twelve pendulum observations were made at each point during half a day and

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twice as great a number of observations at the starting point. The time was determined by Bordeaux rythmic signals. The co-swinging of the support was determined at the beginning and at the end of the observations by Borras' method in two mutually perpendicular directions. The altitude was determined by means of barometric leveling with relation to the railway line.

The duration of the swinging of pendulums at different points is given in a table. The theoretical value of gravity was calculated by using Helmert's formula. The final result is shown in a table.

A curve is drawn to show the variation of gravity along the profile between Slatoust and Tcheliabinsk.

The points where the gravity was determined in previous years are shown --Author's abstract.

(900) EIN NEUER INTEGRATOR ZUE BERECHNUNG VON SCHWERTWERTEN

(A NEW INTEGRATOR FOR CALCULATING GRAVITY VALUES)

By F. Kaselitz

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 191-195.

A description of the apparatus and of its operation is given. A photographic picture is added.

According to the author, an accuracy of about 5 per cent can be obtained; that is, the instrument answers entirely the demands of practical work, taking into consideration the fact that the gradients are often measured with a much smaller accuracy.

In addition to the saving of time the apparatus has the advantage of avoiding possible mistakes in calculation and in counting.--W. Ayvazoglou.

(901) SUR LE PENDULE DE GRAVITÉ

(ON THE GRAVITY PENDULUM)

By J. Haag

Comptes Rendus de l'Académie des Sciences, Paris, vol. 193, No. 26, 1931, pp. 1391-1393.

Theoretical investigations on the period of oscillation of a pendulum suspended to an elastic spring or fastened at its lower end by means of an elastic spring are discussed.--W. Ayvazoglou.

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(902) GRAVITY ANOMALIES

By E. A. Glennie

Nature, London, vol. 128, No. 3241, 1932, p. 1004.

As a result of a somewhat lengthy investigation of large negative and positive anomalies in India, the author draws the conclusion that the Hayford hypothesis of isostatic compensation is incorrect, and that gravity anomalies can be adequately explained by a warping up and down of the crustal layers. The author says that although these conclusions have been mainly derived from observations made in India, there appears to be good evidence that gravity anomalies, outside India in both continental and oceanic areas, can be successfully explained by crustal warpings without compensation.

A paper describing these investigations will be published as one of the professional papers of the Survey of India.--W. Ayvazoglou.

(903) THE EFFECT OF STRATIFICATION ON THE GRAVITY GRADIENT AND THE CURVATURE OF THE LEVEL SURFACE

By Edith A. Nelson

Philosophical Magazine, London, vol. 10, No. 64, 1930, pp. 513-517.

From a mathematical discussion of the effect of stratification on the gravity gradient and the curvature of the level surface, the author concludes that when, in a survey of a region with the Eötvös balance, the curvature vector changes sign where the gradient is a maximum, the earth's crust in that region is stratified, the edge of the stratum being situated below the point of the maximum gradient.--W. Ayvazoglou.

(904) ON THE ABSOLUTE DETERMINATION OF GRAVITY

By A. C. Longden

The Physical Review, Minneapolis, vol. 38, No. 10, 1931, p. 1920.

This is an abstract given by the Physical Review on a paper read at the regular meeting of the American Physical Society held in New York on September 10, 11, and 12, 1931:

> The importance of a new determination is discussed. In the work here described, a reversible pendulum is used in which roller bearings are substituted for knife edges, and quartz suspension rods or tubes are used instead of metal. Invar is disqualified on account of its magnetic properties. The period of the pendulum is determined to within 1 or 2 parts in a million by a very direct method which involves no corrections and which can be performed in a few minutes, while the

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pendulum is swinging through a very small amplitude and while the change of amplitude is quite negligible. The author points out the errors of the "coincidence method" as it is generally used, and shows that it may either be improved, or abandoned as unnecessary. He also cites some of the results on record, which are accepted as highly exact, but which in reality include rather large errors. The method includes a number of refinements in comparing the length of the pendulum with that of a standardized invar rod.

2. MAGNETIC METHODS

(905) MAGNETOMETRIC INVESTIGATION OF MANGANESE ORE DEPOSITS (IN RUSSIAN)

By N. Trubiatchinski

Transactions of the United Geological and Prospecting Service of U.S.S.R., Leningrad, No. 166, 1932, 64 pp.

A magnetic micro-survey was carried out in 1928 and 1929 for determining the influence of manganese ore (MnO_2) upon a homogeneous geomagnetic field.

This task was accomplished in the Nicopol manganese region by a magnetometric field party under the supervision of Trubiatchinski. The method of investigation as described in the "Handbook of magnetic survey" by N. V. Rose and N. Trubiatchinski (see Geophys. Abs. 10, p. 10) were applied. The results of investigations are given in the annexed maps and tables.

According to the interpretation of the magnetic map, including more than 80 per cent of the Nicopol region of manganese ore deposits, the following conditions must be considered to be established:

1. Weak magnetic anomalies were observed everywhere above the manganese deposits; the intensity of the anomalies increased with the magnitude of the manganese layer.

2. A normal homogeneous geomagnetic field was not observed at any place above the manganese deposits.

3. No manganese deposits could be found in regions with normal magnetic field.

4. In regions with weak magnetic anomalies manganese ores, as well as iron deposits, were established.

Based on these four conditions the author draws the following conclusions:

(a) There is no use to search for manganese ore in regions free of weak magnetic anomalies.

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(b) In regions with weak magnetic anomalies in addition to manganese ore various iron ores may be found also.

A manganese deposit of considerable magnitude was found by the magnetic method in the area located between the villages of Marievka and Grushovka.--W. Ayvazoglou.

(906) SUR LA MESURE DIRECTE DES SUSCEPTIBILITÉS MAGNÉTIQUES DES LIQUIDES PAR LA BALANCE MAGNÉTIQUE CURIE-CHENEVEAU

(CONCERNING THE DIRECT MEASUREMENTS OF MAGNETIC SUSCEPTIBILITIES OF LIQUIDS BY MEANS OF THE CURIE-CHENEVEAU MAGNETIC BALANCE)

By C. Chéneveau and C. Courty

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 1, 1932, pp. 75-76.

The authors prove that is is possible to measure directly the magnetic susceptibility of a liquid, even with a tube calibrated in a usual way, by means of the Curie-Chéneveau magnetic balance, without the necessity of weighing and determining the density of the liquid. The density is not taken into consideration, even for the correction of the magnetism.--V. Perebaskine.

(907) VALEURS DES ÉLÉMENTS MAGNÉTIQUES À LA STATION DU VAL-JOYEUX (SEINE-ET-OISE) AU 1-ER JANVIER 1932

(VALUES OF MAGNETIC ELEMENTS AT THE STATION OF VAL-JOYEUX ON JANUARY 1, 1932)

By L. Eblé and G. Gibault

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 11, 1932, p. 1008.

Mean values from all hourly values obtained during the months of December, 1931, and January, 1932,--that is, from 1,488 readings,--are given.

The secular variation presents the same characteristics as in January, 1931.--V. Perebaskine.

(908) A NEW AID TO EXPLORATION IN THE LAKE SUPERIOR DISTRICT

By Holman I. Pearl

Proceedings of the Lake Superior Mining Institute, vol. 28, 1930, pp. 85-98.

A description of the Hotchkiss superdip is given. Its advantages over most other types of dip needles are given as follows:

1. Rapid field manipulation.

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2. Equal facility in measuring the whole range of magnetic anomalies from 10 gammas to thousands of gammas.

3. Combination in one instrument of the functions of a dipping circle and a magnetometer.

The history, principle, constructions, corrections, and sensitivity of the superdip are briefly examined.

Some typical examples of field tests with the superdip, with particular reference to a comparison of results with those obtained with the dip needle are outlined.--W. Ayvazoglou.

(909) ÜBER DIE PHYSIKALISCHE NATUR DES MAGNETISCHEN RINDENFELDES DER ERDE

(ON THE PHYSICAL STRUCTURE OF THE MAGNETIC FIELD OF THE EARTH'S CRUST)

By H. Haalck

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 154-163.

Under the supposition that the permanent magnetic field of the solid earth body consists of a primary core-field of symmetrical rotation by which a secondary field is induced in the outer earth's crust, the strength of the latter depending on the different magnetizability of the earth's crust from place to place, the author examines the question as to what parts of the earth's crust if compared with the adjoining parts, are magnetized more strongly and what parts of it less strongly.

Four distinct regions of stronger magnetizability are established: North America, Asia, Australia, and Africa, and one region of weaker magnetizability, that of the Southwest Atlantic. The causes for these differences in magnetizability were proved to depend on the difference in temperature and material (stronger susceptibility of eruptive rocks if compared with that of ocean water and sediments, probably also the different content of magnetite in single parts of the outer earth's crust).--Author's abstract translated by W. Ayvazoglou.

(910) DIE ERDMAGNETISCHE DEKLINATION IN BULGARIEN

(EARTHMAGNETIC DECLINATION IN BULGARIA)

By Ilia Popoff

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 164-165.

The results of magnetic measurements carried out in 1930 and 1931 for the determination of the declination in Bulgaria are given in the article. The values of declination are valid for the time at which they were determined. --W. Ayvazoglou.

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(911) ABHANDLUNG ÜBER DIE VON DEN ASKANIA-WERKEN ERBAUTE VERTIKAL-FELDWAAGE VON SCHMIDT

(TREATISE CONCERNING SCHMIDT'S VERTICAL FIELD BALANCE MANUFACTURED BY ASKANIA WORKSHOPS)

By Th. Koulomzine and A. Boesch

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3 4, 1932, pp. 166-180.

This treatise was written in the beginning of 1931. The Askania workshops created independently from our studies a new magnet-system which is remarkably insensitive to temperature changes. Also, stimulated by theoretical consideration of the authors on the 180° rotational movement the Askania firm put on the market a new arrangement of the support with mutual independence of the movement of orientation and of the movement of rotation. This article is therefore of theoretical importance only. The authors express the hope that in a further article they will be able to discuss the theory of the changes accomplished by the Askania firm on the new models of the vertical field balance.--Authors' abstract translated by W. Ayvazoglou.

(912) MAGNETIC SURVEYS OVER DYKES

Editorial note

The Mining Magazine, London, vol. 46, No. 4, 1932, pp. 245-247.

This note gives a brief summary of an article by A. S. Eve and D. A. Keys published in the Canadian Mining and Metallurgical Bulletin for March, 1932, under the title "Magnetic surveys over mineral, diabase, and artificial dykes." An abstract of the article is given in Geophysical Abstracts 38.--W. Ayvazoglou.

(913) A SIMPLE APPARATUS FOR THE MEASUREMENT OF THE HORIZONTAL COMPONENT OF THE EARTH'S MAGNETIC FIELD

By L. F. Bates

Journal of Scientific Instruments, London, vol. 8, No. 10, 1932, pp. 324-326.

The apparatus described in this article is a simple adaptation of the apparatus used by Schuster and F. E. Smith for the determination of the horizontal component of the earth's magnetic field. A simple form of apparatus suitable for rapid work is shown in accompanying figures.--W. Ayvazoglou.

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(914) MAGNETIC INVESTIGATIONS AS AN AID TO ECONOMIC GEOLOGY

By R. Krahmann

Transactions of the Geological Society of South Africa, Johannesburg, vol. 33, 1931, pp. 65-89.

Magnetic methods of prospecting are examined by the author in this paper, as, according to his opinion, these methods have the most advantages in solving geological and mining problems in South Africa. The headings of the articles are as follows:

Magnetic susceptibilities of rocks and ores.
Modern instruments.
Costs of magnetic survey.
Theoretical curves.
Some results and their interpretation.
Objects of application.

In his conclusion Krahmann says that from the aspect of the economic geology the application of magnetic investigation may be indicated in the following propositions:

The location of iron-ore deposits.

The location of unmagnetic ore deposits such as copper, nickel, etc., if they are associated with intrusions of flows of igneous rocks.

The location of unmagnetic ore deposits such as platinum, tin, chrome, tungsten, etc., if they are associated with magnetic minerals.

The location of noble minerals in placer deposits, such as platinum, gold, osmiridium, etc., if they are deposited together with magnetic sands.

The location of igneous intrusions, plugs, dykes, etc.

The location of tectonic phenomena such as anticlines, synclines, fault lines, etc., if one member of the sedimentary formations is magnetic or diamagnetic.

The location of salt domes and associated oil deposits.

The location of oil deposits, if they are associated with tectonic phenomena as mentioned above.

The article is completed by 20 figures and a general bibliography.
--W. Ayvazoglou.

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(915) TEKTONIK UND ERDMAGNETISMUS IN DER PRIEGNITZ

(STRUCTURE AND EARTH MAGNETISM IN THE PRIEGNITZ)

By H. Reich

Zeitschrift der Deutschen Geologischen Gesellschaft, Berlin, vol. 82, No. 10, 1930, p. 720.

North of the bend in the Elbe River near Havelberg a magnetic anomaly was found of about 40 kilometers in length and 25 kilometers in width which also has been indicated by the gravity measurements. The Tertiary (Miocene) structure of the Priegnitz surrounds the region of the disturbing body and extends beyond this region in the southern part. The disturbing region is a part of a well-known very old tectonic feature extending from the Donau to the Elbe; it can be traced geophysically from there northward.--W. Ayvazoglou.

(916) MAGNETISCHES SCHÜRFEN AUF ROT-UND BRAUNEISENERZE

(MAGNETIC PROSPECTING FOR HEMATITE AND BROWN IRON ORES)

By H. Reich

Zeitschrift der Deutschen Geologischen Gesellschaft, Berlin, vol. 83, No. 7, 1931, pp. 502-509.

Contents:

1. Magnetic properties of iron ores.
2. Possibilities for applicability of magnetic methods.
3. Technique of measurements.
4. Results of investigations.
5. Results of calculations.

Magnetic properties of iron ores and their magnetic susceptibilities are discussed. A conclusion is drawn that iron ores are generally magnetized very weakly and are not apt to produce considerable anomalies. Examples of measurement are discussed and the anomalies obtained are given. Theoretical calculations as to the magnitude of anomalies to be expected above a vertical orebody in various depths are examined. According to these calculations it is not likely that these hematite and brown iron ores may be detected at a depth greater than 50 meters.--W. Ayvazoglou.

(917) SOME PHASES OF MAGNETOMETER WORK IN MISSOURI

By H. A. Buehler

Bulletin of the American Association of Petroleum Geologists, Tulsa, vol. 16, No. 5, 1932, p. 531.

This paper, of which only the title is given in the bulletin, was presented by the author at the Tulsa Geological Society meeting, May 2, 1932.

--W. Ayvazoglou.

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(918) GEOMAGNETIC SURVEYS IN ALBERTA

By J. E. Duncan

Bulletin of the American Association of Petroleum Geologists, Tulsa, vol. 16, No. 5, 1932, p. 531.

This paper was presented by the author at the annual meeting on January 29 and 30 of the Alberta Society of Petroleum Geologists, Calgary, Alberta. The contents of the paper are not given.--W. Ayvazoglou.

3. SEISMIC METHODS

(919) SUR LA PROPAGATION D'UN SÉISME A L'INTÉRIEUR D'UN SOLIDE HOMOGÈNE, ISOTROPE, ÉLASTIQUE, SEMI-INDÉFINI, LIMITÉ PAR UNE SURFACE PLANE

(ON THE PROPAGATION OF A SHOCK INSIDE OF A HOMOGENEOUS, ISOTROPIC, ELASTIC, SEMI-INDEFINITE SOLID BODY LIMITED BY A PLANE SURFACE)

By L. Cagniard

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 10, 1932, p. 899.

The purpose of the author consists of generalizing the results obtained by Lamb. He deals with the problem treated by him as follows:

1. By supposing that the source mentioned is situated at the depth and not on the surface.

2. By studying the propagation inside of the ground.

3. By avoiding, in the first place, the resolution into Fourier's integrals.--V. Perebaskine.

(920) SUR LA RÉFLEXION À LA SURFACE DU SOL D'UNE ONDE SISMIQUE, SPHÉRIQUE ET ISOTROPE

(ON THE REFLECTION ON THE SURFACE OF THE GROUND OF A SEISMIC, SPHERICAL AND ISOTROPIC WAVE)

By L. Cagniard

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 11, 1932, p. 1005

The author continues his studies concerning the seismic wave (see the previous article).

In this article he describes the function B by which the wave reflected by distortion is defined.--V. Perebaskine.

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(921) ÜBER DIE DISPERSION SEISMISCHER OBERFLÄCHENWELLEN

(ON THE DISPERSION OF SEISMIC SURFACE WAVES)

By Walter Rohrbach

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 113-129.

Length of the wave and velocity of propagation are calculated from various periods of the surface waves by using especially distinct seismograms recorded in Göttingen, Apia (Samoa), and Zi-Ka-Wei (Shanghai); based on these calculations the dispersion curves of the single earthquakes are drawn.

The factors on which the position and the shape of the dispersion curve depend are examined; the decrease of the velocity of a certain wave length with the increase of the distance of the epicenter and how and where the cross waves and the Rayleigh waves are separated one from another is explained. Finally the depth of the uppermost layer, as well as the transversal velocity in the two uppermost layers are calculated for the Eurasian continent from the dispersion curve.--Author's abstract translated by W. Ayvazoglou.

(922) EIN BEITRAG ZUR THEORIE DER REFLEXION UND BRECHUNG ELASTISCHER WELLEN AN UNSTETIGKEITSFLÄCHEN

(CONTRIBUTION TO THE THEORY OF REFLECTION AND REFRACTION OF ELASTIC WAVES FROM LAYERS OF DISCONTINUITY)

By Heinr. Blut

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 130-144.

Parts of the energy are calculated in which a primary longitudinal wave is separated at the moment of striking upon a surface limiting two different elastic media. Calculations are carried out taking into consideration the secondary transversal effects, as well as disregarding them. It is shown how far this disregarding can be made in numerical calculations.--Author's abstract translated by W. Ayvazoglou.

(923) DAS NORDTIROLER BEBEN VOM 8 OCTOBER 1930. I TEIL

(THE NORTH-TIROL EARTHQUAKE OF OCTOBER 8, 1930. PART I)

By H. Gräfe

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 144-154.

The investigation of this earthquake has been carried out based on 57 diagrams recorded at 27 stations. It was proved that the focus of the quake

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had a linear extension of 25 kilometers in the direction N.30° E. The line of the focus coincided with a dislocation line of over 40 kilometers of the direction N.40° E. The depth of the focus of the earthquake calculated by two methods was determined to be 35 kilometers. Travel-time equations were derived and compared with those obtained from previous European earthquakes. The depth of the P-layer was calculated to be equal to d= 48 kilometers. --Author's abstract translated by W. Ayvazoglou.

(924) SUR CERTAINES ONDES LONGUES RAPIDES, EN PARTICULIER SUR L'ONDE PL D' O. SOMVILLE

(CONCERNING SOME LONG RAPID WAVES, IN PARTICULAR CONCERNING THE O. SOMVILLE'S PL WAVE)

By Coulomb

Comptes Rendus de l'Académie des Sciences, Paris, vol. 193, No. 23, 1931, pp. 1211-1214.

Formulas for the displacement component of the PL wave are derived. The present article is written in continuation of Somville's previous articles published in Gerlands Beitrage der Geophysik, vol. 27, No. 3-4, 1930; vol. 29, No. 2, 1931; and vol. 33, No. 2, 1931 (see Geophys. Abs. 21, 26, and 32).--W. Ayvazoglou.

(925) A GALVANOMETRICALLY REGISTERING VERTICAL SEISMOGRAPH WITH TEMPERATURE COMPENSATION

By J. Wilip

Acta et Commentationes Universitatis Tartuensis, Dorpart (Tartu) vol. 20, A, 1931, pp. 1-54.

A description is given of a vertical seismograph with temperature compensation, which until now has only been constructed in Estonia.

The theory of this apparatus is deduced and proved by means of measurements, the conformity being found to be sufficiently great. Directions are given for the adjustment of the apparatus and especially of the temperature compensation. The temperature compensation proves to be very nearly correct with proper treatment, and the vertical seismograph will stand prolonged working in the pendulum room without any protection against heat.

Methods are discussed for a more precise adjustment of the period symmetry.

The pendulum shows a regular oscillation with a weak proper damping, the period depending only very little on the amplitude.

The principles of construction advocated by the author have proved successful and allow a general application of them to be expected in the construction of vertical seismographs of different sensitiveness and methods of registration.

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With a loosely fitting cover the influence of variable atmospheric pressure is observed. The seismograph acts like a baroscope.

The dependence of the proper period on the temperature is ascertained and a method is recommended for easily avoiding possible errors.

The constants are determined and the sensitiveness is examined, which gives a maximum magnetification of about 1,500 times and may be increased at wish.

A secondary phenomenon is observed in the apparatus, and precautionary measures are indicated for its removal.

The differences of temperature outside and inside the glass cover is examined.

Henceforth cellar rooms with small annual amplitude of temperature variations are found to be unnecessary for the erection of seismographs. Any quiet room with provision for heating can be used as a room for a seismic station.

In conclusion the principal formulas which may be conveniently applied in the galvanometric registration method are given.--Author's abstract.

(926) A THREE-DIMENSIONAL VIBROGRAPH

By J. E. Shrader

The Physical Review, Minneapolis, vol. 38, No. 10, 1931, p. 1923.

This paper was reported at the regular meeting of the American Physical Society held in New York on September 10, 11, and 12, 1931.

It deals with a new vibrograph which has been devised for indicating and recording simultaneously in the same plane vibrations of a body in each of three directions mutually perpendicular. The vibrograph operates on the seismographic principle. The instrument shows amplitude of vibration, wave form, phase relations and frequency of three components of vibration simultaneously on the same plane.--W. Ayvazoglou.

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4. ELECTRICAL METHODS

(927) BEITRÄGE ZUR MESSTECHNIK UND ANWENDUNG DER METHODE DES SCHEINBAREN SPEZIFISCHEN WIDERSTANDES

(CONTRIBUTION TO THE TECHNIQUE OF MEASUREMENT AND APPLICATION OF THE METHOD OF THE APPARENT SPECIFIC RESISTANCE)

By W. Stern

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 181-191.

Theoretical principles of geoelectrical methods for prospecting the subsoil consisting of horizontal layers based on the measurements of the "apparent specific resistance" are examined. As the derivation of these formulas was already done by J. N. Hummel (Zeitschrift für Geophysik, vol. 5, No. 3|4 and 5|6, see Geophys. Abs. 9 and 10), the author uses here only the basic formulas necessary for the interpretation of homogeneous, isotropic subsoil consisting of horizontal layers. The arrangement of the measurements is described and the results of measurements carried out in the lignite-fields of Ville (Lower Rhine) are given. The results were confirmed by borings.-- Author's abstract translated by W. Ayvazoglou.

(928) ELECTRICAL PROSPECTING FOR AURIFEROUS QUARTZ VEINS AND REEFS

By Helmer Hedstrom

The Mining Magazine, London, vol. 46, No. 4, 1932, pp. 201-213.

The present article is intended as a brief description of some new applications of those geoelectrical methods which are characterized by the determination of electrical potentials. These "potential methods" have previously been used almost solely for the locating of buried bodies of better electrical conductivity than the surroundings. The new applications of these methods are used to locate or determine the distance to boundary planes between different rock formations. According to whether these boundary planes are nearly horizontal or nearly vertical, the new applications are divided by the author into the two following classes:

1. "Electrical drilling," which comprises the determination of thickness of overburden, depth to the ground water table, dip of slightly inclined sedimentary beds at moderate depth, etc. This process is not discussed by the author as it has been dealt with already in many recent publications.

2. "Electrical trenching," comprises the locating of hidden contacts, fault planes, quartz veins, bankets, and reefs. This process should, according to the author, be of particular interest to mining men in these times of increasing activity in the field of gold prospecting.

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Theoretical considerations of "electrical trenching" are explained and examples of practical results given.

Thirteen figures accompany the article.--W. Ayvazoglou.

(929) CHAMP ÉLECTROMAGNÉTIQUE PRODUIT PAR UN FIL PARCOURU PAR UN CURRANT ALTERNATIF SINUSOÏDAL AU-DESSUS D'UNE COUCHE CONDUCTRICE

(THE ELECTROMAGNETIC FIELD PRODUCED BY A WIRE CARRYING A SINUSOIDAL ALTERNATING CURRENT ABOVE A CONDUCTING LAYER)

By Dubordieu

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 10, 1932, p. 848.

Mathematical discussion on the question is given.--W. Ayvazoglou.

(930) POTENTIAL DUE TO A BURIED SPHEROID

By J. H. Webb

The Physical Review, Minneapolis, vol. 38, No. 11, 1931, pp. 2056-2068.

In a previous article, "Potential due to a buried sphere" (see Geophys. Abs. 23, p. 76) the author indicated the solution of the problem. The purpose of the present paper is to extend the solution of that problem to the case of a buried spheroid.

Author's abstract reads as follows:

> A series solution of the problem dealing with the electrical potential due to a buried conducting spheroid under the influence of a surface point electrode is given. The problem is complicated by the boundary condition requiring the vanishing of the normal derivative of potential on the surface of the half space. This condition is satisfied by placing an image spheroid in the upper half space. The problem then reduces to that of finding the potential due to two spheroids whose potentials react upon each other. The interaction of the potentials is handled analytically by means of a transformation theorem in spheroidal harmonics dur to B. Datta. The method of solution employed leads to an infinite number of equations in an infinity of unknowns. An approximate method for solving these questions is given. It is believed by the author that the inverse distance formula in spheroidal harmonics, which is derived, is new.--W. Ayvazoglou.

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(931) THE ELECTRICAL PROPERTIES OF THE SOIL AT RADIO FREQUENCIES

By J. A. Ratcliffe and F. W. G. White

Philosophical Magazine, London, vol. 10, No. 65, 1930, pp. 667-680.

Laboratory experiments have been made at radio frequencies to investigate the way in which the effective conductivity σ and the effective dielectric constand ε of the soil vary with frequency. The results of the experiments are shown in figures. The bearing of these results on some problems of the propagation of wireless waves is discussed, and the conclusion is reached that the only satisfactory way of measuring these quantities is to measure them for ground in situ and at the frequency required, either by the tilt method or by means of attenuation curves.--Authors' abstract.

5. RADIOACTIVE METHODS

(932) THE VARIATION OF PENETRATING RADIATION WITH ZENITH DISTANCE

By Gilberto Bernardini

Nature, London, vol. 129, No. 3259, 1932, pp. 578-579.

In this article the author describes his attempt to investigate the problem of the variation of penetrating radiation with zenith distance. The measurements were made in a wooden hut, the walls and roof of which were 3.5 centimeters thick. For the purpose of observing only the rays coming from a relatively small solid angle, the author used the coincidence method between the impulses of two Geiger-Muller tube counters. To eliminate the softer component of the penetrating radiation, a block of lead 5 centimeters thick was interposed between the two counters at a distance of 0.7 centimeter from the lower one.

The results are as follows:

ϕ =	0	20	40	60	75
Coincidences in $17^h\ 20^m$ =	1616	1441	1018	404	181
Number per hour =	93.2 ± 2.5	83.2 ± 2.5	58.4 ± 2.2	23.3 ± 1.7	10.5 ± 1.4

In the first line are shown the values of the angle ϕ between the vertical and the plane containing the axes of the counters; in the second the total number of coincidences observed in $17^h\ 20^m$ in each of these positions. The casual coincidences, amounting to 13.8 per hour, have been deducted from the above figures. The third line shows the mean value of the number of coincidences in an hour, with the corresponding statistical error. These latter values are also represented graphically.

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The author concludes that he notes from the results that the intensity curve, as a function of the zenithal angle, seems to be somewhat sharper than would be expected from absorptions by the atmosphere.--W. Ayvazoglou.

(933) AUTOMATIC RECORDING OF HEAVISIDE LAYER HEIGHTS

By Eric L. C. White

Nature, London, vol. 129, No. 3259, 1932, p. 579.

The author gives sample records obtained by a method developed by him for continuous automatic recording of Heaviside layer heights.

The records, given in a figure, show the following results:

(a) Jump from E layer (110 km.) to F layer (330 km.).

(b) Splitting of echo from F layer. The upper component apparently vanishes due to electron limitation, while the lower component persists.

The author expects to publish further details of the method in the near future.--W. Ayvazoglou.

(934) RADIOLOGICAL INVESTIGATION OF THE PSECUP'S MINERAL SPRINGS (IN RUSSIAN)

By E. Tsitovich

Transactions of the Geological and Prospecting Service of U.S.S.R., 1932, No. 102, pp. 135-163.

The author investigated:

1. Nineteen mineral springs, 17 in situ, by means of the Makbe and Meyer type fontactometer and by the laboratory indoor method by means of the emanation electroscope, according to the X-ray method.

2. Thirty-three core samples from various boreholes, by the same laboratory methods.

3. Three platforms on the earth's surface with respect to the radioactivity of the air, by means of a fontactometer.

The radioactivity (measured in Mache's units with introduction of corrections) of the Psekup's mineral springs proved to be, on the whole, small, varying from 0.1 to 2.1 M-E.

The radioactivity of the waters from boreholes was determined not only for samples taken on the surface but also from a depth.

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The laboratory investigation of samples taken from the same springs after a period necessary for obtaining a radioactive equilibrium of the emanation with the radium, showed that the samples measured according to the X-ray method by means of the emanation electroscope displayed a considerably greater radioactivity than the samples measured by means of the fontactometer in situ, --namely, from 0149 to 4.03 M-E, which corresponded to a radium content in them varying from $0.177 \cdot 10^{-9}$ to $1.466 \cdot 10^{-9}$ grams per liter of water.

The investigation of the radioactivity of drill cores taken at various depths from 3 to 184 meters showed that the radium content of 1 gram of the rock varied from $0.04 \cdot 10^{-10}$ to $4.00 \cdot 10^{-10}$ grams. The variation of the radioactivity of the cores taken from various depths in the same boreholes showed that strata of the earth having greater radioactivity are generally not located at a great depth.

As a general rule the radioactivity of rocks decreases with the increase of the depth of their location. The radioactivity of the rocks and of the samples of water taken from similar depths corresponded.

For the investigation of the radioactivity of air, carried out at two places in a park (at distance between them equal to 400 to 450 meters) and at a place outside of the park about 1.5 kilometers distant, the author used the method of depositing on the isolated conductor with a high negative potential the products of splitting the emanation and after this of measuring the radioactivity of the wire by means of a fontactometer, taking all possible precautions of constructive character with respect to the method of coiling this conductor and making the necessary corrections. He found that 1 meter of wire on the mineral platform lost 29.83 to 39.3 volts per hour; on the platform near the Jubilee spring 211.9 to 226.2, and on the platform near the iodine bromic spring (outside of the park) 117.4 to 141 volts.--W. Ayvazoglou.

(935) RADIUM IN ROCKS: LOCATION AND ASSOCIATION OF RADIUM IN IGNEOUS ROCKS

By C. S. Piggot and H. E. Merwin

American Journal of Science, New Haven, vol. 23, No. 133, 1932, pp. 49-56.

Two granites of high radium content were separated into their component minerals and these examined in detail for radium.

The radium is associated much more with the micas, weight for weight, than with the other components of the rock. Why this should be so is not evident.

Hot water removes from most powdered specimens some of the emanation in equilibrium with the radium present but apparently does not affect this radium, and probably not the parent uranium. It did not affect the radioactivity of one biotite at all.

The radioactivity of leached samples was completely restored after 30 days.--Authors' abstract.

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(936) A NEW EXPERIMENT BEARING ON COSMIC-RAY PHENOMENA

By L. M. Mott-Smith and G. L. Locker

The Physical Review, Minneapolis, vol. 38, No. 8, 1931, pp. 1399-1408.

This new experiment consists in combining a Wilson cloud expansion apparatus with Geiger-Müller electron counters in a manner which permits the simultaneous study of individual cosmic-ray particles by the two methods. Its purpose was to see whether the coincidence effect in electron counters is actually caused by the passage of an ionizing particle through them as has been generally assumed. This was considered desirable because it was felt that the several conflicting cosmic-ray experiments could perhaps be more satisfactorily explained by assuming the coincidences to be produced by photons. In this work a series of expansion photographs was taken under experimental conditions which allowed a definite correlation of an ion-track appearing in the expansion chamber with a discharge of a Geiger-Müller counter. It was found that the discharges of a counter due to cosmic radiation are accompanied by ion tracks resembling those due to fast β rays from radioactive sources. This result means that, in accord with previous beliefs, the coincidence effects are caused by ionizing particles. The best assumption we can make at present appears to be that these are high-energy electrons. The possibility that these effects are due to photons appears to be excluded, so that the reconciliation of the conflicting experimental data in this field will have to follow other lines.--Authors' abstract.

(937) BESTIMMUNG DER KONSTANTEN, INSBESONDERE DER KAPAZITÄT VON STRAHLUNGSAPPARATEN

(THE DETERMINATION OF CONSTANTS, ESPECIALLY OF CAPACITIES OF IONIZATION CHAMBERS

By Werner Kolhörster

Physikalische Zeitschrift, Leipzig, vol. 31, No. 6, 1930, pp. 280-284.

The author outlines the results of his experience concerning the accuracy with which the constants of ionization chambers can be determined. Examples of measurements are given.--W. Ayvazoglou.

(938) ZUR KAPAZITÄTSBESTIMMUNG VON STRAHLUNGS APPARATEN

(CONCERNING THE DETERMINATION OF CAPACITIES OF IONIZATION CHAMBERS)

By V. F. Hess and A. Reitz

Physikalische Zeitschrift, Leipzig, vol. 31, No. 6, 1930, pp. 284-288.

Investigations concerning the determination of the capacities of ionization chambers in connection with Kolhorster's article foregoings are discussed.--W. Ayvazoglou.

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6. GEOTHERMAL METHODS

(939) TEMPERATURE OF FORMATION OF AN EPI-THERMAL ORE DEPOSIT

By H. C. Boydell

Bulletin of the Institution of Mining and Metallurgy, London, Nos. 331 and 332, 1932, pp. 1-43 and 25-39.

This paper was presented at the 7th ordinary general meeting of the 41st session of the Institution, held on April 21, 1932. In this article a discussion of the paper is given.

The present paper provided a striking example of a problem in mining geology attacked by the mathematical method, and in that respect it was not only novel but almost unique.

The paper inquired into "The extent of temperature rise produced by a lava flow on underlying rock, and the influence of such heating on an ore deposit formed there."

An actual example, namely the Camp Bird gold mine in southwest Colorado, had been chosen by Boydell for his investigations.

The Camp Bird deposit is briefly described. In the summary given by the author, Boydell enumerates the conclusions drawn from his investigations. --W. Ayvazoglou.

(940) RESULTS OF WELL TEMPERATURE TESTS IN WYOMING

By Bravity Taylor

The Petroleum Engineer, Dallas, Tex., vol. 3, No. 8, 1932, p. 64.

The author gives a brief description of a series of experiments carried out by the State oil and gas inspector of Wyoming relative to the temperatures obtained in wells in that State.

The description of the apparatus used to obtain temperature measurements in wells with the accuracy required for a study of this nature is accompanied by an illustration.

The operation of the apparatus is explained.

The average run of well-bottom temperatures in Wyoming has been found, according to the experiments, to be between 90° and 180°. It has been found that the time element in taking temperatures is a very important one. The deepest well in Wyoming, at 8,725 feet in the second Wall Creek sand, was found to have a temperature of 140°.--W. Ayvazoglou.

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7. UNCLASSIFIED METHODS

(941) GEOPHYSICAL PROSPECTING

By H. A. Buehler

Biennial report of the State Geologist, Missouri, Bureau of Geology and Mines, 1931, pp. 15-16 and 146-151.

The inauguration of geophysical methods of prospecting in 1929 and conducting field work by using electrical resistivity methods and carrying out magnetic surveys is mentioned in this report. Plates illustrating the results obtained are added.--W. Ayvazoglou.

(942) VARIATION DE LA TENSION SUPERFICILLE DE LA MATIÈRE FULMINANTE EN FONCTION DE LA TEMPERATURE ET DU POIDS MOLÉCULAIRE

(VARIATION OF THE SURFACE TENSION OF THE FULMINANT MATTER IN FUNCTION OF TEMPERATURE AND MOLECULAR WEIGHT)

By E. Mathias

Comptes Rendus de l'Académie des Sciences, Paris, vol. 194, No. 5, 1932, pp. 413-416.

The author concludes that the surface tension of the fulminant (explosive) matter is in proportion to the square of the molecular mass, and in an inverse ratio to the cube of the absolute temperature, and that the surface tension of the fulminant matter is, other things being the same, a hundred times greater than that of the ordinary air of the same temperature.--V. Perebaskine.

(943) ÜBER EINE MESSUNG DER BEWEGUNG VON PFEILERN

(CONCERNING THE MEASUREMENT OF THE MOVEMENT OF PILLARS)

By J. Egedal

Zeitschrift für Geophysik, Braunschweig, vol. 8, No. 3|4, 1932, pp. 195-196.

The measurements were carried out in a cellar. The instruments (a leveling variometer and a hydrostatic leveling apparatus) were placed on two marble pillars, 5 meters distant one from another. The result of the measurements is graphically represented in a figure. According to the result obtained the author draws the conclusion that the instruments are suitable for measuring small changes in the elevation of the earth's crust.--W. Ayvazoglou.

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(944) THE ECONOMIC RELATION OF GEOPHYSICS TO GEOLOGY ON THE GULF COAST

By J. Brian Eby

Economic Geology, Lancaster, Pa., vol. 27, No. 3, 1932, pp. 231-247.

The purpose of this paper is to review briefly the contribution of geophysical research to the mineral exploration of the Gulf coast. The present and probable future status of geophysics on the coast is discussed and an attempt is made to relate the geophysical expenditures with the increased mineral valuations, both actual and potential, obtained by these methods.

The results of geophysical exploration are represented graphically, showing the chronological arrangement of all discoveries on the Texas and Louisiana Gulf coast. The areal distribution of salt domes and other Coastal producing fields is shown in a map. Two diagrams are added, one giving the annual production curve for the Gulf Coast salt-dome region of Louisiana and Texas and showing increasing geophysical production, and another giving the curve showing annual geophysical costs compared to valuation of oil and sulphur produced on Texas and Louisiana Gulf coast.--W. Ayvazoglou.

9. NEW BOOKS

(945) Anmuaire de l'Institut de Physique du Globe 1930. (Strasbourg, 1931). (Annuary of the Institute of the Physics of the Earth). Part I, Meteorology. Strasbourg, 1931, 20 tables.

(946) Davison, Dr. Charles. The Japanese earthquake of 1923. Thomas Murby and Co., London, 1931, 125 pp., 6 plates. Price, 7 s. 6 d. net. In this volume an account of the great Japanese earthquake of 1923 is given from two points of view: First, as it affected man and his works and, secondly, from the viewpoint of geophysics. The geophysical discussion summarizes 41 scientific memoirs, almost entirely by Japanese writers.

(947) Hevesy, Georg V., and Paneth, Fritz, Lehrbuch der Radioaktivität (Handbook of radioactivity). Johann Ambrosius Barth, Leipzig, 2d ed., 1931, 287 pp. The data of radioactivity have been brought up to date. The book is an informative, critical, and accurate textbook, covering not only the physical side of the subject with its many topics, but also the chemical and geological sides.

(948) Plummer, F. B., and Sargent, E. C. Underground waters and subsurface temperatures of the Woodbine sand in northeast Texas. Univ. of Texas Bull. 3138, October 8, 1931, 178 pp., 56 figures, 9 plates, 8 tables. Published by the University of Texas, Austin. Contents: Introduction; Geology of the Woodbine sand; Underground waters of the Woodbine sand; Normal constituents of Woodbine waters; Abnormal mineral constituents of Woodbine waters; Underground temperatures in the Woodbine sand; Comparison of chemical and thermal investigations; Selected bibliography.

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The objectives of the investigation are summed up by the authors as follows: (1) To measure the temperature gradients in wells that penetrate the Woodbine sand in all parts of the province and to ascertain to what extent temperature gradients in the vicinity of abnormal structure and oil pools vary from those in wells on normal structure; (2) to study the chemical composition of the underground waters and ascertain how the composition changes in different parts of the province, especially in relation to abnormal structure and to oil pools; (3) to determine to what extent, if any, a change in the chemical content of the water is responsible for the abnormal temperature gradients along faults and on salt domes; (4) to compile the analytical and thermal data into tables, maps, and diagrams useful to petroleum engineers and geologists.

10. PATENTS

(949) PENDULUM APPARATUS

Josef Andre, of Rochester, New York

United States patent 1,858,384 Patent issued May 17, 1932.

This invention relates to methods of determining the contour of subterranean strata or boundaries of geologic formations. The invention is incorporated in the form of a pendulum apparatus employing one or more pendulums which are constructed and mounted in a novel manner so that their swinging movements may be minutely observed and accurately measured and the necessary computations from the observations and measurements made more accurately and in a shorter time than heretofore.

Claims allowed - 25.

(950) TORSION BALANCE

Ludwig W. Blau, of Houston, Texas, assignor to Standard Oil Development Co.

United States patent 1,861,229 Patent issued May 31, 1932.

The invention comprises the application to the torsion balance of the Kelvin bifilar suspension mirror instead of the usual mirror at the center of the balance beam. The main objects of the invention consist of reducing the time of reading and increasing the reliability of the instrument by shortening the time during which temperature changes or other disturbing causes may influence the exactness of the reading.

Claims allowed - 3.

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(951) VARIOMETER

William Dubilier, of New Rochelle, New York, assignor to Dubilier Condenser Corporation, of New York, N. Y., a corporation of Delaware.

United States patent 1,861,052 Patent issued May 31, 1932.

The object of the invention is to provide a means and method for controlling the tuning of a multistage radio receiver over a very wide range, and with a comparatively small quantity of apparatus, and material for constructing the same. The invention comprises the combination with a radio receiving set having appliances for detecting and amplifying oscillations, of a plurality of devices for controlling said appliances, the devices having the form of coils with means for varying the effective number of turns thereof, all of the coils being mounted so that said means can be operated in unison, and the coils being disposed so that the axis of each is perpendicular to the axis of all the rest.

Claims allowed - 4.

(952) METHOD AND APPARATUS FOR SOUNDING AND FOR LOCATING SUBMARINE OBSTACLES BY MEANS OF ULTRA-AUDIBLE WAVES

Paul Langevin and Charles Louis Florisson, of Paris, France, assignors to Société de Condensation et d'Applications Mécaniques, of Paris, France, a corporation of France.

United States patent 1,858,931 Patent issued May 17, 1932.

The present invention relates to methods and apparatus for producing and receiving ultra-audible waves for the accurate determination of the distance of any submarine obstacle capable of reflecting ultra-audible waves.

The method consists in emitting, by means of the piezo-electric apparatus a short signal consisting of a set of ultra-audible waves, and in measuring the time t between the beginning of the emission and the beginning of the reception of the waves reflected from the obstacle.

Claims allowed - 2.

(953) OSCILLOGRAPH

Harvey C. Hayes, of Washington, District of Columbia.

United States patent 1,860,740 Patent issued May 31, 1932.

The invention relates primarily to instruments employed for the indication or recording of slight electrical impulses or disturbances of various kinds. Instruments of the type contemplated usually comprise some form of

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string galvanometer and any suitable means for reproducing in magnified form the vibrations produced in the galvanometer string as a result of the electrical impulse imposed upon it.

A primary object of the present invention has been to provide a simple and compact device capable of receiving and reproducing impulses from several sources simultaneously. To this end, in lieu of the single galvanometer string, a plurality of such strings are provided and all are mounted in a single container or holder in such a way as to be in very close proximity and in a definite plane.

Claims allowed - 13.

(954) MEANS AND METHOD OF OBSERVING AND MEASURING ELECTROMAGNETIC FIELDS

Norman H. Ricker, of Houston, Texas, assignor to J. P. Scranton, of Houston, Texas, Trustee.

United States patent 1,859,005 Patent issued May 17, 1932.

This invention relates to a means and method of measuring alternating electromagnetic fields in general, and finds application in exploring for underground mineral deposits.

One object of this invention is to provide a method of observing and measuring electromagnetic fields based on the use of the differential field between two slightly separated points as compared with the field itself in the neighborhood of these two points.

A further object is to provide an apparatus for making observations by means of this method whereby the nature of the electromagnetic field is determined. A mathematical theory of the method is developed.

Claims allowed - 12.

(955) HORIZONTALVARIOMETER

(HORIZONTAL VARIOMETER)

Dr. Richard Ambronn of Göttingen

German patent 530,166 Patent issued July 22, 1931.

This invention relates to a horizontal variometer, characterized by the connection of a magnetic needle, suspended on the torsion filament, with an optical arrangement for reading the position of the two needle points in the same range of vision, in order to obtain a simultaneous determination of the rotation of the magnetic needle around its vertical axis and of the lateral displacement of the needle caused by the inclination of the variometer toward the vertical line,

Claims allowed - 1.

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(956) FELDWAAGE

(FIELD BALANCE)

Hauser and Co., G.m.b.H., of Augsburg

German patent 530,595 — Patent issued July 31, 1932.

The invention discloses an arrangement for measuring the vertical earth-magnetic change of the directing force by means of one or several magnetized bodies secured above or below the oscillating system; one or several of these magnetized bodies are made rotatable about an axis parallel to the axis of oscillation of the field magnet.

Claims allowed - 1.

(957) DREHWAAGE MIT MEHREREN DAS GEHÄNGE UMGEBENDEN SCHUTZKÄSTEN

(TORSION BALANCE WITH SEVERAL PROTECTING CASINGS SURROUNDING THE SUSPENSION DEVICE)

Askania-Werke A.G. vorm. Centralwerkstatt Dessau und Carl Bamberg-Friedenau of Berlin-Friedenau

German patent 536,306 — Patent issued Oct. 22, 1932.

The general object of the present invention is to provide an improvement by which the air, at least between the two inner casings surrounding the suspension device, is put in constant circulation. In this manner an irregular heating of the most inner protecting casing is avoided.

Claims allowed - 5.

(958) VERFAHREN ZUR BESTIMMUNG DER MAGNETISCHEN EIGENSCHAFTEN DER OBERSTEN ERDSCHICHTEN

(METHOD FOR DETERMINING THE MAGNETIC PROPERTIES OF THE UPPERMOST EARTH LAYERS)

Hauser and Co., G.m.b.H. of Augsburg and Johannes Ostermeier in Althegnenberg, Obb.

German patent 539,741 — Patent issued March 10, 1932.

According to this invention the determination of the magnetic properties of the uppermost earth layers is carried out in such a manner that for the calculations of the magnetic permeability and of the magnetic susceptibility obtained from the data of the earthmagnetic field, an artificial mass defect, suitable in form and magnitude, is produced in the uppermost earth layer and the course of the disturbance of the earthmagnetic field is determined, for example, by measuring with the magnetic field balance.

Claims allowed - 1.

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(959) STROMRICHTUNGSANZEIGER

(POLARITY INDICATOR)

Askania-Werke A.G. vorm. Centralwerkstatt Dessau und Carl Bamberg-Friedenau of Berlin-Friedenau.

German patent 530,673 Patent issued July 31, 1932.

This invention relates to a polarity indicator and is characterized by the following arrangement: The device is provided with a floating body inside of which there is another body secured to it by means of a Cardan suspension. The two bodies are adjusting themselves: The first in the direction of the current, and the second in the vertical direction. The outer Cardan ring which is firmly secured to the floating body has a graduation arc, and the body provided with the Cardan suspension an adjustable index (or vice versa). The mutual position of these two parts indicates the inclination of the floating body toward the body with Cardan suspension, thus also the direction of the current in a vertical plane.

Claims allowed - 5.

(960) VERFAHREN ZUR ERMITTLUNG VON ELEKTRISCH GUT LEITENDEN, IN EINE FLÜSSIGKEIT VERSENKTEN MASSEN DURCH FESTSTELLUNG DER WIDERSTANDSÄNDERUNG DER FLÜSSIGKEITSSTRECKE ZWISCHEN EINGETAUCHTEN STROMFÜHRENDEN ELEKTRODEN

(METHOD FOR DETECTING BODIES OF GOOD ELECTRIC CONDUCTIVITY SUNK INTO A LIQUID BY DETERMINING THE VARIATION OF THE ELECTRIC RESISTANCE OF THE SECTION OF THE LIQUID BETWEEN THE IMMERSED ELECTRODES CARRYING CURRENT)

James Basset of Paris

German patent 534,562 Patent issued Oct. 1, 1931.

This invention discloses a method for detecting bodies of good electric conductivity sunk into a liquid; the method is characterized by the following arrangement: The electrodes are connected to a cable provided with a pluralit; of conductors in such a manner that each conductor is divided into two sections, each of the latter being connected to one of the electrodes; the ends of the sections are provided with synchronously rotating switches.

Claims allowed - 2.

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(961) VERFAHREN ZUM ERKENNEN DER DURCH TIEFBOHRLÖCHER DURCHTEUFTEN BODENSCHICHTEN MITTELS ELEKTRISCHER WIDERSTANDSMESSUNG

(METHOD OF INVESTIGATING THE LAYERS OF THE GROUND PENETRATED BY BOREHOLES BY MEANS OF MEASURING THE ELECTRICAL RESISTANCE)

Société de Prospection électrique Procédés Schlumberger of Paris

German patent 534,563 Patent issued Sept. 28, 1931.

The invention relates to a method by which the local electrical specific resistance at various depths is obtained by lowering the measuring apparatus into a drill hole. The arrangement provides for three electrodes connected to isolated cables of different lengths and lowered into the hole; one of the three electrodes is connected with the source of current and the two others serve as probes.

Claims allowed - 2.

(962) ELEKTROMETER ZUR ERDERFORSCHUNG DURCH VERGLEICHSMESSUNG DER ELEKTRISCHEN LEITFÄHIGKEIT DER LUFT AN MEHREREN STELLEN.

(ELECTROMETER FOR EXPLORATION BY MEANS OF COMPARATIVE MEASUREMENTS OF ELECTRICAL CONDUCTIVITY OF THE AIR AT SEVERAL PLACES)

Louis Müller of Berlin-Baumschulenweg

German patent 535,556 Patent issued October 13, 1931.

The invention relates to an electrometer for exploration by means of comparative measurements of electrical conductivity of the air at several places. It is characterized by the following arrangement: Two or more lamellae, one above the other, independent one from another, of the same magnetization and rotatable around a vertical axis, as well as a corresponding number of immovable walls consisting of isolating material and provided with conducting coating, are arranged inside of a case in such a manner that by charging at any potential, the lamallae, which originally are close to the coating and are adjusted in the direction north-south, are deviated from this direction at equal angles. After this the connection of the conducting coating with the collectors installed at various places of the region under investigation is established and the velocity of the retrograde movements of the different lamallae is compared.

Claims allowed - 3.

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(963) VERFAHREN UND EINRICHTUNG ZUR ELEKTRISCHEN BODENFORSCHUNG MIT WECHSELSTROM NACH DER SONDENMETHODE UNTER VERWENDUNG EINES KOMPLEXEN WECHSELSTROMKOMPENSATORS

(METHOD AND ARRANGEMENT FOR ELECTRICAL PROSPECTING WITH ALTERNATING CURRENT ACCORDING TO THE PROBE-METHOD BY USING A COMPLEX ALTERNATING CURRENT COMPENSATOR

Prospector-Institut für praktische Geophysik und Geologie, Dr. Hülsenbeck and Co. of Frankfurt am Main.

German patent 536,097 Patent issued October 20, 1931.

The invention relates to a method and arrangement for electrical prospecting in which a complex alternating current compensator is used. According to the new arrangement a fixed phase length, most suitable for electrical investigations, can be imparted to the measuring current flowing through the compensator.

Claims allowed - 5.

(964) VERFAHREN UND EINRICHTUNG ZUR ELEKTRISCHEN BODENFORSCHUNG MIT WECHSELSTROM NACH DER INDUKTIONSRAHMENMETHODE UNTER VERWENDUNG EINES KOMPLEXEN WECHSELSTROMKOMPENSATORS

(METHOD AND ARRANGEMENT FOR ELECTRICAL PROSPECTING WITH ALTERNATING CURRENT ACCORDING TO THE INDUCTION FRAME METHOD BY USING A COMPLEX ALTERNATING CURRENT COMPENSATOR)

Prospector Institut für praktische Geophysik und Geologie, Dr. Hülsenbeck and Co. of Frankfurt am Main.

German patent 536,098 Patent issued October 19, 1931.

According to the new arrangement to which this invention relates, a fixed phase length, most suitable for electrical investigations, is applied to the measuring current flowing through the compensator.

Claims allowed - 5.

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(965) VERFAHREN ZUR BESTIMMUNG DES KALIUMGEHALTES IM ERDREICH, IN ABLAGERUNGEN, TECHNISCHEN PRODUCTEN U. DGL.

(METHOD FOR DETERMINING THE CONTENT OF POTASSIUM IN THE EARTH, IN DEPOSITS, TECHNICAL PRODUCTS, ETC.)

Dr. Werner Kolhörster of Berlin-Friedenau.

German patent 536,006 Patent issued February 2, 1932.

The invention relates to the method for determining the content of potassium in the earth, etc., by which the gamma radiation emanated by potassium acts upon a measuring instrument; the ionization produced inside of this measuring instrument serves for the determination of the specific content of potassium.

Claims allowed - 2.

(966) METHOD AND APPARATUS OF PROSPECTING FOR ORE

By D. L. Gandler

Russian patent 17,521 Patent issued September 30, 1930.

This invention relates to the method and apparatus of prospecting for ore. Conclusions on the velocity of propagation of the electromagnetic waves are drawn from the amplitude of the wave reflected from the surface separating each two adjoining nonconducting layers. From this velocity of propagation the physical and chemical properties of the rocks are determined.

Claims allowed - 3.

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INDEX[3]

	Page
Ambronn, R. (955, 10)	555
Andre, Josef (949, 10)	553
Askania-Werke (957, 10)	556
_____ (959, 10)	557
Basset, James (960, 10)	557
Bates, L. F. (913, 2)	537
Bernardini, G. (932, 5)	546
Blau, L. W. (950, 10)	553
Blunt, H. (922, 3)	541
Boesch, A. (911, 2)	537
Boydell, H. C. (939, 6)	550
Bueler, H. A. (917, 2)	539
_____ (941, 7)	551
Cagniard, L. (919, 3)	540
_____ (920, 3)	540
Chéneveau, C. (906, 2)	535
Coulomb, (924, 3)	542
Courty, C. (906, 2)	535
Davison, Ch. (946, 9)	552
Dubilier, W. (951, 10)	554
Dubordieu, (929, 4)	545
Duncan, J. E. (918, 2)	540
Eblé, L. (907, 2)	535
Eby, J. Brian (944, 7)	552
Egedal, J. (943, 7)	551
Florisson, Ch. L. (952, 10)	554
Gandler, D. L. (966, 10)	560
Gibault, G. (907, 2)	535
Gishitsky, A. M. (898, 1)	531
_____ (899, 1)	531
Glennie, E. A. (902, 1)	533
Goudey, R. (896, 1)	529
Gräfe, H. (923, 3)	541
Haag, J. (901, 1)	532
Haalck, H. (909, 2)	536
Hauser, (956, 10)	556
_____ (958, 10)	556
Hayes, Harvey C. (953, 10)	554
Hedström, H. (928, 4)	544

3 - The first figure refers to the number of the abstract, the second to the method of prospecting as indicated in the Table of Contents, and the third to the page.

Generated on 2024-09-17 12:27 GMT / https://hdl.handle.net/2027/osu.32435030644140
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Digitized by Google
Original from THE OHIO STATE UNIVERSITY

Page

Hess, V. F. (938, 5) 549
Hevesy, G. (947, 9) 552
Holweck, M. F. (895, 1) 529
Hulsenbeck, (963, 10) 559
_____ (964, 10) 559

Institut de Physique de Globe, Annuaire (944, 9) 552

Kaselitz, F. (900, 1) 532
Kolhörster, Werner (937, 5) 549
_____ (965, 10) 560
Koulomzine, Th. (911, 2) 537
Krahmann, R. (914, 2) 538

Langevin, P. (952, 10) 554
Lejay, P. (896, 1) 529
Locker, G. L. (936, 5) 549
Longden, A. C. (904, 1) 533

Mathias, E. (942, 7) 551
Merwin, H. E. (935, 5) 548
Mining Magazine (Editorial) (912, 2) 537
Mott-Smith, L. M. (936, 5) 549
Müller, Louis (962, 10) 558

Nelson, Edith A. (903, 1) 533
Numerov, B. (897, 1) 530

Ostermeier, Johannes (958, 10) 556

Paneth, F. (947, 9) 552
Pearl, Holman J. (908, 2) 535
Piggot, C. S. (935, 5) 548
Plummer, F. B. (948, 9) 552
Popoff, I. (910, 2) 536

Reich, H. (915, 2) 539
_____ (916, 2) 539
Reitz, A. (938, 5) 549
Ricker, N. H. (954, 10) 555
Rohrbach, W. (921, 3) 541

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Page

Sargent, E. C. (948, 9) 552
Shrader, J. E. (926, 3) 543
Société de prospection électrique (961, 10) 558
Stern, W. (927, 4) 544

Taylor, Bravity (940, 6) 550
Trubiatchinski, N. (905, 2) 534
Tsitovich, E. (934, 5) 547

Webb, J. H. (930, 4) 545
White, Eric L. (938, 5) 547
White, F. W. (931, 4) 546
Wilip, J. (925, 3) 542

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